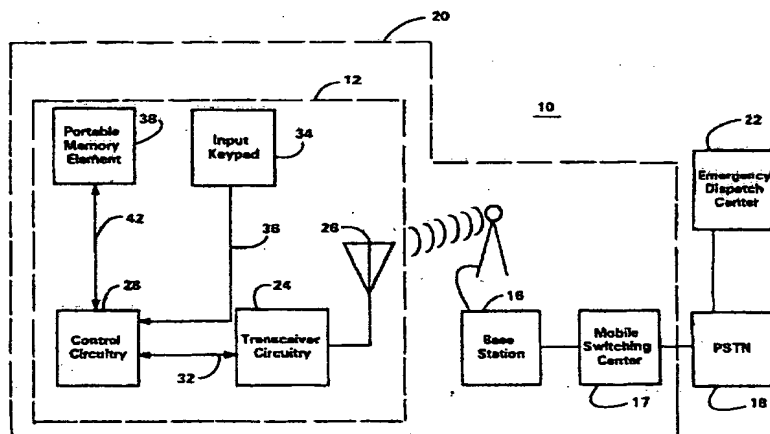


PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H04Q 7/22		(11) International Publication Number: WO 97/23104
A1		(43) International Publication Date: 26 June 1997 (26.06.97)
(21) International Application Number: PCT/US96/20419		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).
(22) International Filing Date: 19 December 1996 (19.12.96)		
(30) Priority Data: 08/574,554 19 December 1995 (19.12.95) US		
(71) Applicant: ERICSSON INC. [US/US]; 7001 Development Drive, P.O. Box 13969, Research Triangle Park, NC 27709 (US).		
(72) Inventor: VALENTINE, Eric, Lee; 1600 Brazos Trail, Plano, TX 75075 (US).		
(74) Agents: MOORE, Stanley, R. et al.; Jenkins & Gilchrist, P.C., Suite 3200, 1445 Ross Avenue, Dallas, TX 75202 (US).		Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: RADIO TRANSCEIVER MEMORY DEVICE AND METHOD FOR FACILITATING EMERGENCY COMMUNICATIONS



(57) Abstract

A device (12) and associated method (72) for automatically transmitting information by way of a radio transceiver (24) responsive to a request for emergency assistance initiated by way of the radio transceiver (24). Informational data pertaining to a subscriber is stored in a portable memory element (38), such as a SIM memory card of a cellular, communication system (20). When entry of a request, such as entry of the digits "9-1-1" for emergency assistance is requested, the informational data is automatically accessed and transmitted to provide emergency personnel (22) with the informational data.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

**RADIO TRANSCEIVER MEMORY DEVICE AND METHOD
FOR FACILITATING EMERGENCY COMMUNICATIONS**

5 **TECHNICAL FIELD OF THE INVENTION**

 The present invention relates generally to the communication of data by way of a radio transceiver to an emergency dispatch center. More particularly, the present invention relates to a device and method for automatically
10 transmitting information to the emergency dispatch center when a call is placed at the radio transceiver to the emergency dispatch center.

BACKGROUND OF THE INVENTION

15 In recent years, telephonic communication effectuated by way of a cellular, or other wireless, communication network has become increasingly popular. In such a system, communication signals are transmitted between two communication stations by way of transmission of radio
20 frequency signals upon radio frequency channels. Because a wireline connection is not required to effectuate the telephonic communication with a remotely-positioned communication station, telephonic communication by way of the cellular, or other wireless, communication network is
25 possible in situations in which a wireline connection connecting the communication stations is impractical.

 Initiation of telephonic communication links in a cellular communication system is typically accomplished in a manner analogous to the initiation of telephonic
30 communication links in a conventional, wireline, telephonic system. A calling party initiates communication with a called party by entering an

-2-

identification number, i.e., the telephone number, of the party to whom telephonic communication is to be effectuated. Network switching apparatus interprets the telephone number and provides the necessary connections to effectuate the telephonic communication. Calls can be placed by way of, e.g., a radio telephone forming the remotely-positioned, communication station to any other station coupled to the telephonic network by entering and transmitting the telephone number of the called party.

10 In some sections of the United States, telephonic networks provide emergency "911" service. Other countries provide analogous service. In areas of the country which provide for "911" service, a caller requiring emergency assistance dials, or enters, the digits 9-1-1. When the telephonic network detects entry of such digits, connection of the calling party to an emergency dispatch center is immediately effectuated. In other countries, other sequences of digits are entered by a caller, similarly to be connected to an emergency dispatch center.

20 An emergency call can be placed by a subscriber of a radio telephone in a manner similar to the manner by which a caller located at a wireline station can place an emergency call. However, in a conventional telephonic network in which "911" emergency service is provided, dispatch personnel of the emergency dispatch center are provided with the position from which the request for emergency assistance is initiated. The personnel of the emergency dispatch center utilize such positional information to facilitate the dispatch of emergency personnel to the scene of the emergency.

30

-3-

While the positional information can be readily provided to the dispatch personnel of the emergency dispatch center when the calling party is located at a conventional, wireline, calling station, if the calling party utilizes a radio telephone, or other wireless communication device, to request the emergency assistance, the position of the calling party cannot be automatically provided to the dispatch personnel of the emergency dispatch center. In the event that the calling party is unable otherwise to provide the dispatch personnel with the location at which the emergency assistance is required, the appropriate emergency assistance might not be able to be provided.

If the calling party is not able to provide the dispatch personnel with the required positional information, the calling party might well be the one necessitating the emergency assistance. The nature of the emergency as well as information relating to the calling party might well similarly not be able to be communicated by the calling party to the dispatch personnel.

In order to permit communication by way of, or with, a radio telephone operable in a conventional, cellular, or other wireless, communication network, certain control information must be communicated between the radio telephone and the fixed, network portion of the cellular communication network. For instance, an electronic serial number which uniquely identifies a radio telephone in the cellular communication system must be transmitted by the radio telephone to the fixed, cellular network portion during call set-up procedures. The electronic serial number is stored in a memory element of the radio

-4-

telephone. Other data is similarly stored at the radio telephone.

Several existing and planned wireless networks provide for the utilization of radio telephones which make use of removable memory elements, sometimes referred to as "SIM" cards. The removable memory elements contain data including the aforementioned electronic serial number. The Group Special Mobile (GSM) cellular, communication system provides for the utilization of radio telephones having removable memory elements. In the GSM system, the removable memory elements are disposed on or in a card member. The radio telephone includes an assemblage, referred to as a card reader assembly, for receiving a card member. A card reader assembly typically comprises structure forming a receiving platform and electrodes positioned in proximity to the receiving platform. The electrodes are also coupled to other structure of the radio telephone and permit an electrical connection to be formed with corresponding electrodes of a removable memory element.

The electrodes of the removable memory element are disposed upon a face surface of the card member. When the card member is suitably positioned at the receiving platform of the card reader assembly, the electrodes of the card member and the card reader assembly become aligned with one another and electrical connections are formed therebetween. Once suitably aligned and connected, the information stored within the memory element may be transferred to the circuitry of the radio telephone.

Radio telephones which permit the utilization of removable memory elements are advantageous, at least in

-5-

part, for the reason that a user of more than one radio telephone may alternately operate the two or more radio telephones while requiring only a single billing account. Calls placed by either of the radio telephones, when the
5 memory element is suitably positioned therein, are, e.g., billed to a single billing account.

At least two configurations of SIM card member dimensions have been standardized. A first standardized configuration of card member, sometimes referred to as a
10 C-Net-sized card member (as specified in the International Standard, ISO 7816, Parts 1-3) defines the dimensions of the card member to correspond generally to the physical dimensions of a conventional credit card. A second, standardized configuration of card member, sometimes
15 referred to as a D-Net-sized card member (as also specified in the International Standard, ISO 7816, Parts 1-3) defines dimensions of the card member to be of smaller dimensions than those of the C-Net-sized card member.

20 Either of such card members, as well as other memory elements, include user-defined memory element portions. User-defined memory element portions permit the storage of user-defined data therein. Such user-defined data is in addition to the electronic serial number and other data
25 also stored in the memory element. Such user-defined memory element portions have been utilized, for example, to store speed-dialing, calling lists. Speed-dialing calling lists facilitate the entry of calling codes by a subscriber of services in the communication system.

30 Other data in such user-defined memory element portions can also be stored. Certain data stored in the

-6-

memory element would additionally facilitate the dispatch of emergency assistance in the event that a request for emergency assistance is made by a subscriber to a cellular, or other wireless, communication system.

5 It is in light of this background information related to removable memory elements utilized in wireless communication systems that the significant improvements of the present invention have evolved.

10 SUMMARY OF THE INVENTION

The present invention advantageously provides a device and method for a radio telephone operable in a cellular, or other wireless, communication system which facilitates the communication of informational data to an
15 emergency dispatch center. The informational data is communicated to the emergency dispatch center automatically when a call to the emergency dispatch center is placed at the radio telephone. Because the information is transmitted automatically, information is provided to
20 the emergency dispatch center even if the subscriber of the radio telephone is unable otherwise to communicate with personnel of the emergency dispatch center.

By storing the informational data at the removable memory element which also contains identification data,
25 the informational data is portablized in the same manner in which the identification data is portablized upon the memory element. Any radio telephone in which the memory element is inserted for conventional reasons, i.e., for billing and operational reasons, is automatically provided
30 with the informational data associated with the subscriber. In the event that an emergency call is placed

-7-

with the radio telephone, such informational data is automatically provided to an emergency dispatch center.

When the radio telephone is positioned together with a global positioning receiver, positional data generated by the global positioning receiver is also provided automatically to the dispatch personnel of the emergency dispatch center. The position, which might otherwise be indeterminate, of the subscriber placing the emergency call can thereby be provided to the emergency dispatch center to facilitate the dispatch of appropriate emergency personnel.

In accordance with one aspect of the present invention, therefore, a device, and an associated method, provides informational data associated with a subscriber of a radio communication system to an emergency dispatch center. The radio communication system is permitting of telephonic communication by way of a mobile subscriber unit and is operable at least to communicate telephonically with the emergency dispatch center responsive to entry of a request entered by way of a mobile subscriber unit transducer. A memory element is removably connectable to the mobile subscriber unit. Informational data associated with the subscriber is stored in the memory element. An emergency request controller detects times in which the request to communicate telephonically with the emergency dispatch center is entered by way of the mobile unit. Responsive thereto, the informational data stored at the memory element is transmitted to the emergency dispatch center.

A more complete appreciation of the present invention and the scope thereof can be obtained from the

-8-

accompanying drawings which are briefly summarized below, the following detailed description of the presently-preferred embodiments of the invention, and the appended claims.

5

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a functional block diagram of a communication system which incorporates an embodiment of the present invention as a portion thereof.

10

Figure 2 is a perspective view of a card member containing a memory element of an embodiment of the present invention which stores informational data therein.

15

Figure 3 is an hierarchical block diagram illustrating the hierarchical arrangement of data stored in the memory element shown in Figure 2.

Figure 4 is a logical flow diagram illustrating the method of operation of an embodiment of the present invention.

20

Figure 5 is a diagram illustrating the format of an emergency message transmitted during operation of an embodiment of the present invention.

25

Figure 6 is a functional block diagram illustrating fixed-station equipment of an embodiment of the present invention and the connection thereof to an emergency dispatch center.

30

Figure 7 is a functional block diagram of another embodiment of the present invention.

DETAILED DESCRIPTION

Referring first to Figure 1, a communication system, shown generally at 10 is shown. An embodiment of the

-9-

present invention forms a portion of the communication system 10. The communication system 10 forms a wireless communication system, here a cellular communication system. The teachings of the present invention may analogously be utilized in other types of wireless communication systems and the following description of operation of embodiments of the present invention in a cellular communication system is exemplary in nature.

The system 10 includes a radio telephone 12 which generates and transmits radio frequency signals upon a radio frequency channel to a fixed-site base station 16. The base station 16 is coupled to a mobile switching center (MSC) 17. The mobile switching center, in turn, is coupled to a public service telephonic network (PSTN) 18.

The PSTN 18, in conventional manner, is coupled to numerous wireline locations, such as the emergency dispatch center 22. While not shown in the figure, a conventional cellular communication system typically includes a plurality of base stations positioned at spaced-apart locations throughout a geographical area. The base station 16 illustrated in Figure 1 is exemplary of one of such base stations. The radio telephone 12, base station 16, and MSC 17 together form a public land mobile network (PLMN) 20.

The radio telephone 12 is illustrated in the figure to include transceiver circuitry 24 having transmitter and receiver portions for transmitting and receiving signals by way of an antenna element 26. Operation of the radio telephone 12 is controlled by control circuitry 28 which is coupled to the transceiver circuitry by way of lines

-10-

32. An operator of the radio telephone 12 inputs control commands and data to effectuate operation of the radio telephone by way of an input keypad 34 which is coupled to the control circuitry 28 by way of lines 36. In one embodiment of the present invention, the keypad includes a dedicated key for requesting emergency assistance. Actuation of the dedicated key permits a request for emergency assistance to be made merely by actuation of the dedicated key.

10 A portable memory element 38 is releasably connectable to the control circuitry 28 by way of lines 42. In one embodiment of the present invention, the portable memory element 38 is disposed upon a C- or D-Net-sized card member, as described above. When suitably positioned at, and coupled to, the control circuitry 28, the portable memory element 38 forms a portion of the radio telephone 12. When released out of engagement with the lines 42 extending to the control circuitry 28, the memory element 38 can be removed out of the radio telephone 12, all in conventional fashion.

20 As described above, a portable memory element is received at a card reader assembly, thereby to be connected to the control circuitry 28. The lines 42 extend to electrodes forming portions of the card reader assembly to permit the electrical connections to be formed with the memory element 38.

25 A subscriber of the radio telephone 12 can communicate telephonically with any communication station connected to, or coupled to, the PSTN 18. Telephonic communication can be initiated at the radio telephone 12 by way of appropriate input entered by way of the input

30

-11-

keypad 34. Alternately, telephonic communication can be initiated at another communication station connected to the PSTN 18 in conventional manner.

5 In the event of an emergency situation, a subscriber operating the radio telephone 12 can request emergency assistance by placement of a call to emergency personnel to request assistance. In areas which provide for "911" emergency calls, appropriate entry of the digits "9-1-1" by way of the input keypad 34 initiates communication
10 between the subscriber positioned together with the radio telephone 12 and emergency personnel located at an emergency dispatch center, here emergency dispatch center 22. Once telephonic communication is effectuated between the radio telephone 12 and the emergency dispatch center
15 22, dispatch personnel at the emergency dispatch center 22 can dispatch appropriate emergency personnel to provide assistance to alleviate the emergency.

As noted above, when 911-emergency assistance is requested by way of a wireline device, positional
20 information related to the position of the wireline device is automatically communicated to the emergency dispatch center. Because a wireless device, such as the radio transceiver 12 is not connected to the PSTN 18 by way of a wireline connection, the precise location of the radio
25 telephone 12 can not be automatically communicated to dispatch personnel at the emergency dispatch center. Only the location of the base station 16 at which radio frequency signals 14 transmitted by the radio telephone 12 are received can be automatically transmitted to the
30 emergency dispatch center. Such location can provide dispatch personnel of the emergency dispatch center with

-12-

the general area at which the radio telephone 12 is positioned, but the precise location of the radio telephone can not be determined without the communication of additional information provided by the subscriber at the radio telephone 12.

The subscriber initiating the emergency request by way of the radio telephone 12 might be unable to provide to the dispatch personnel information pertaining to the subscriber's position. If the subscriber is unable to provide the positional information, the subscriber might well be the party in need of emergency assistance, and the subscriber might well be unable to communicate to the dispatch personnel other identification information related to the subscriber, such as the subscriber's medical history and physical characteristics.

In an embodiment of the present invention, identification data is stored at the portable memory element 38. The identification data includes, *inter alia*, data pertaining to the medical history of the subscriber and the physical characteristics of the subscriber. In the event that the subscriber initiates a call to an emergency dispatch center, such as the center 22, the control circuitry 28 detects such initiation and automatically transmits the identification data stored at the portable memory element 38 whereat detection of such transmitted information can thereafter be provided to the dispatch personnel of the emergency dispatch center.

The identification data stored at the portable memory element 38 can be retrieved and thereafter modulated by the transmitter portion of the transceiver circuitry 24 in a manner analogous to the manner by which the

-13-

electronic serial number and other data conventionally stored at the portable memory element is retrieved therefrom and modulated by the transceiver circuitry 24. Once modulated, the data is transmitted upon a radio frequency channel.

Appropriate software or hardware logic of the control circuitry 28 can detect entry of a selected sequence of digits by way of the input keypad 34, such as the aforementioned 9-1-1 sequence. Alternately, actuation of a particular key of the keypad 34 dedicated for emergency communications can be detected by logic of the control circuitry. Upon detection of entry of a particular sequence of digits, or actuation of the dedicated key, the control circuitry 28 accesses memory locations of the portable memory element 38, retrieves the data stored therein, and provides such data to the transceiver circuitry 24 to be modulated thereat. While separate lines 42 and 32 are illustrated in the figure, the data retrieved from the portable memory elements may be transmitted by way of an internal bus of the radio telephone 12 to the transceiver circuitry 24.

In one embodiment of the present invention, the identification data transmitted by the radio telephone 12 is received by the base station 16 and thereafter stored in a storage location which is accessible by personnel of the emergency dispatch center. When the telephonic communication is effectuated with the dispatch center 22, the personnel of the dispatch center are provided with an indication that the identification data has been received at the base station 16 and stored in appropriate storage elements coupled thereto. The personnel of the emergency

-14-

dispatch center can thereafter retrieve such storage data if necessary.

The portable memory element 38 is again shown in Figure 2. In the embodiment illustrated in Figure 2, the memory element forms a C-Net-sized card member of physical dimensions corresponding roughly to the dimensions of a conventional-sized credit card. The memory element 38 is of dimensions specified for a C-Net-sized SIM card and includes a read only memory (ROM) portion, a random access memory (RAM) memory portion and an electrically erasable programmable read only memory (EEPROM) memory portion.

An integrated circuit 42 mounted upon a plastic frame 44 forms the various memory element portions in which information is stored. A series of electrodes 46 are formed upon a face surface of the memory element 38 to permit connection with corresponding electrodes of a conventional, card reader assembly of a radio telephone. The memory element can be carried by a subscriber to a cellular, or other wireless, communication system and inserted into any radio telephone constructed to receive such a memory element.

If a subscriber to a cellular, or other wireless, communication system possesses two or more radio telephones, each operative to receive a portable memory element, such as the portable memory element 38, the subscriber can alternately use a selected one of the radio telephones by inserting the portable memory element 38 therein. Once inserted, data stored in the memory locations of the memory element, such as the electronic serial number, can be accessed. The subscriber thereby incurs only a single activation and maintenance fee while

-15-

being permitted to utilize, alternately, any of many radio telephones to communicate by way of the cellular, or other wireless, communication system. A card member of another size, such as a D-Net-sized card member, is similar in function with the C-Net-sized card member and can be similarly illustrated.

Figure 3 illustrates functionally the information stored in the memory locations of the memory element 38 according to an embodiment of the present invention. The memory element 38 includes a directory 48 which is first accessed, in conventional manner, when data stored in the memory locations of the memory element 38 is to be accessed or retrieved. Selected memory locations of the memory element 38 are accessed by first addressing the directory 48.

In the embodiment of the memory element 38 illustrated in the figure, the memory element further includes a security subdirectory 52 which is further accessed when security-related information is accessed. An encryption key 54 is exemplary of security data stored in the memory element 38. The encryption key 54 is used to encrypt data prior to transmission at the radio telephone and to decrypt data transmitted to the radio telephone.

A listing of authorized operators 56 is also stored in the programmable memory element 38. A list of authorized operators indicate the carriers whose systems are authorized to be accessed during operation of the radio telephone. The memory locations addressed by way of the security directory and the listing of authorized operators is typically stored in the memory locations of

-16-

the memory element upon activation of the subscriber's service with a cellular communication system.

Personal security data 58 and an abbreviated dialing list, i.e., a speed-calling list, 62 are also stored in the memory locations of the memory element 38. In an embodiment of the present invention, identification data 64, identifying the subscriber with the subscriber's personal identification information, such as physical characteristics and medical information, is also stored in memory locations of the memory element 38.

The personal security data 58, the abbreviated dialing list 62, and the identification data 64 can be stored, for instance, in EEPROM memory portions of the memory element 38 to permit updating of the information stored therein, when appropriate.

In one embodiment of the present invention, the data 58, the dialing list 62, and the identification data 64 is stored in the memory locations at the same time in which the other data is stored in other memory locations of the memory element 38. In another embodiment of the present invention, the data 58, dialing list 62, and identification data 64 are stored in the memory locations by the subscriber by way of appropriate interaction with, for example, the input keypad of a radio telephone. In this embodiment, the subscriber is able to update such user-defined data, whenever desired. Once stored in the memory locations, the data stored therein can be addressed and retrieved by accessing the directory 48.

During operation of an embodiment of the present invention, when a request for emergency assistance is requested by the subscriber, the identification data 64

-17-

stored in the memory element 38 is automatically accessed and transmitted automatically to provide emergency dispatch personnel with such identification data. Because the identification data is automatically transmitted, emergency personnel are provided with the identification data even if the subscriber is unable to communicate properly such information to the emergency dispatch personnel.

Figure 4 illustrates a method, shown generally at 72, of operation of an embodiment of the present invention. The method 72 retrieves informational data of a subscriber when a request for emergency assistance is requested by the subscriber. The request is made by way of a radio telephone, such as the radio telephone 12 shown in Figure 1, and a programmable memory element, such as the memory element 38, is coupled to the radio telephone to form a portion thereof.

First, and as indicated by the decision block 74, a determination is made as to whether a request, e.g., entry of the digits "9-1-1", for emergency assistance has been entered. If not, a no branch is taken to program exit 76. If a request for emergency assistance has been entered, the yes branch is taken to decision block 76.

At the decision block 78, a determination is made as to whether positional information pertaining to the position of the subscriber when the request for emergency assistance is entered is available. If so, the yes branch is taken to block 80 whereat the format, by way of type of positional information, is identified. Thereafter, and as indicated by the block 82, a location field is populated with the positional information. If, positional

-18-

information is not available, a no branch is taken from the decision block 78 to block 84 where the format and location field is populated with null values.

5 A determination is thereafter made, as indicated by the logic block 86, as to whether a user-defined memory-element portion of the programmable memory element includes medical information of the subscriber. If so, a yes branch is taken to block 88 and a medical information parameter is set to a "true" logical value.
10 Then, and as indicated by block 92, a field is populated with medical information retrieved from the memory element. If, conversely, the no branch is taken from the logic block 86, the medical information parameter and medical information field is populated with null values,
15 as indicated by the block 94.

Thereafter, and as indicated by the decision block 96, a determination is made as to whether the user-defined memory-element portion includes physical information of the subscriber. If so, a yes branch is taken to the block
20 98 and a physical information parameter is set to a "true" logical value. Then, and as indicated by the block 102, a physical information is populated with physical information retrieved from the memory element. If the no branch is taken from the decision block 96, the physical
25 information parameter and physical information field is populated with null values, as indicated by the block 104.

Thereafter, an emergency information data message is transmitted by the radio telephone, as indicated by the
30 block 106.

-19-

The operation of the method 72 automatically retrieves data from a portable memory element and causes transmission of such retrieved data merely upon detection of entry of an emergency request. The subscriber of the radio telephone is able to provide emergency personnel with the information stored in the memory element without further action on the subscriber's part. If the subscriber is unable otherwise to communicate to emergency personnel such information, the emergency personnel are still able to obtain the emergency information stored in the programmable memory element of the subscriber, and the emergency personnel are better able to facilitate a response to the emergency request. Figure 5 illustrates a message format, shown generally at 112, which is formed during operation of an embodiment of the present invention. The information generated during operation of the method 72, shown in Figure 4, forms a portion of the information formatted according to the message format 112. The message format is the general format defined for a personal communications system (PCS) 1900, wireless communication system.

The PCS 1900 system defines an emergency setup which defines a call message structure for a mobile-originated emergency call placed by a radio telephone operable in a PCS 1900 communication system. Other communication systems define other message formats and structures and the message format illustrated in Figure 5 is exemplary in nature.

The message format 112 includes a protocol discriminator 114, a transaction identifier 116, a message-type identifier 118, a bearer capability lock 122,

-20-

and an extension information block 124. The data contained in the elements or blocks 114-122 are all defined in the aforementioned PCS 1900 systems. The extension information 124 is populated with the data generated during operation of the method 72, shown in Figure 4.

According to the protocol of operation of a radio telephone operable in the PCS 1900 system, a message formatted according to the message format 112 shown in Figure 5 is generated and transmitted responsive to entry of a request, such as entry of the digits "9-1-1", for emergency assistance. The informational data contained in the portable memory element can thereby be provided automatically, merely by entry of the request for the emergency assistance by the subscriber.

Figure 6 illustrates a portion of fixed-site equipment of a cellular communication system and the connection of such equipment to an emergency dispatch center 22, shown previously in Figure 1. A base station 16 which receives signals generated by a radio telephone is again shown in the figure. The base station 16 is here shown to be connected to the public service telephonic network 18 by way of a mobile switching center 128. The mobile switching center is coupled to an operation and maintenance center (OMC) 132 in conventional manner. The base station 16, mobile switching center 128, and OMC 132 form portions of a public land mobile network 20.

An emergency setup message transmitted according to, for example, the message format 112, is received by the base station 16 and supplied to the MSC 128. The extension information 124 formed of the informational data

-21-

is provided to the OMC 132 where, for example, the information can be displayed. The incoming call is routed, in normal fashion, to the emergency dispatch center 22. The emergency dispatch center is able to determine the MSC 128 of the cellular communication system from which the call has originated. The emergency dispatch center is also provided with an indication that the MSC 128 supports the reception of the extension information 124. Dispatch personnel of the emergency dispatch center are able to inquire of the OMC 132 if additional informational data regarding the request for emergency assistance has been received. Responsive thereto, the OMC provides access to the dispatch personnel with the received informational data. Use of the informational data facilitates the dispatch of appropriate emergency personnel responsive to the request. An SS7 communication system, conventional in the art, encompasses the portion of the fixed-site equipment shown in Figure 6 according to one embodiment of the present invention. As an SS7 communication system supports an Integrated Service Digital Network (ISDN) User Part (ISUP), the extension information can be supplied directly to the emergency dispatch center 22 rather than to the OMC 132 by appropriate protocol support added to the ISUP. For instance, by extension of the ISUP, the extension information can be added as part of a calling party information field, analogous, e.g., to extensions to DTAP. The extension information can be, e.g., explicitly stated in the ISUP message, such as in the initial address message. In other embodiments, the switches interconnecting the emergency information requester and

-22-

the dispatch center can further store indications as to whether the network supports the transmission of the extension information in such manner. Such an embodiment obviates the need by the emergency personnel to separately
5 access the OMC 132.

Figure 7 illustrates a radio telephone, shown generally at 212, of which another embodiment of the present invention forms a portion. Analogous to the radio telephone 12 shown in Figure 1, the radio telephone 212
10 generates and transmits radio frequency signals upon a radio frequency channel to a fixed-site base station (not shown in the figure).

The radio telephone 212 is illustrated in the figure to include transceiver circuitry 224 having transmitter and receiver portions for transmitting and receiving
15 signals by way of an antenna element 226. Operation of the radio telephone is controlled by control circuitry 228 which is coupled to the transceiver circuitry by way of lines 232. An operator of the radio telephone 212 inputs control commands and data to effectuate operation of the
20 radio telephone by way of an input keypad 234 which is coupled to the control circuitry 228 by way of lines 236.

A portable memory element 238 is releasably connectable to the control circuitry 228 by way of lines
25 242. The portable memory element 238 is similar in structure and function with the portable memory element 38 shown in preceding figures.

The radio telephone 212 further includes a global positioning receiver 244, operative in conventional manner
30 in a global positioning system to determine the latitudinal and longitudinal, or other positional,

-23-

coordinates of the global positioning receiver 244. The global positioning receiver 244 is coupled to the control circuitry 228 by way of the lines 246.

The radio telephone 212 is operable in manners analogous to operation of the radio telephone 12 shown in Figure 1 to retrieve informational data stored at the portable memory element 238 responsive to entry of a request for emergency assistance by a subscriber. In this embodiment, the positional coordinates determined by the global positioning receiver 244 are also retrieved by the control circuitry 228.

Both the positional information and the informational data are provided to the transceiver circuitry 224 in a desired message format and transmitted automatically by the radio telephone 212. In this manner, emergency dispatch personnel are provided not only with informational data pertaining to the subscriber, but also with positional data identifying the physical location at which the request for emergency assistance has been initiated.

Operation of embodiments of the present invention facilitate the communication of at least informational data to an emergency dispatch center when a call to the emergency dispatch center is placed at the radio telephone. Because the information is transmitted automatically, information is provided to the emergency dispatch center even if the subscriber is unable otherwise to communicate with personnel of the emergency dispatch center.

Any radio telephone in which a memory element, such as the memory element 238, is inserted is automatically

-24-

provided with the informational data associated with the subscriber. In the event that an emergency call is placed with the radio telephone, such informational data is automatically provided to an emergency dispatch center.

5 If the radio telephone further includes a global positioning receiver, precise, positional data is also provided to the emergency dispatch personnel.

10 Presently-preferred embodiments of the present invention have been described with a degree of particularity. The previous descriptions are of preferred examples for implementing the invention, and the scope of the invention should not necessarily be limited by this description. The scope of the present invention is defined by the following claims.

-25-

WHAT IS CLAIMED IS:

1. A device for providing informational data associated with a subscriber of a radio communication system to an emergency dispatch center by way of a mobile subscriber unit, the mobile subscriber unit operable at least to communicate telephonically with the emergency dispatch center responsive to a request entered by way of a mobile unit input element, said device comprising:

a memory element removably connectable to the mobile subscriber unit, said memory element for storing therein the informational data associated with the subscriber; and

an emergency request controller for detecting times in which the request to communicate telephonically with the emergency dispatch center is entered by way of the mobile subscriber unit, and responsive thereto, for transmitting the informational data stored at said memory element to the emergency dispatch center.

2. The device of claim 1 further comprising a global positioning receiver positioned together with the mobile subscriber unit, said global positioning receiver for generating positional data indicative of positioning of the mobile subscriber unit, and wherein said emergency request controller is further for transmitting the positional data generated by said global positioning receiver to the emergency dispatch center.

3. The device of claim 2 wherein said emergency request controller transmits the positional data generated by said global positioning receiver responsive to

-26-

detection of the request to communicate with the emergency dispatch center automatically without additional action by the subscriber.

5 4. The device of claim 1 wherein said memory element forms a portion of a SIM card.

 5. The device of claim 4 wherein the informational data is stored at memory locations formatted to be user-
10 defined memory locations of said SIM card.

 6. The device of claim 4 wherein the informational data is stored at said SIM card prior to positioning of the SIM card at the mobile subscriber unit.

15 7. The device of claim 4 wherein the informational data is stored at said SIM card subsequent to positioning of the SIM card at the mobile subscriber unit.

20 8. The device of claim 1 wherein the informational data comprises medical information related to medical characteristics of the subscriber.

 9. The device of claim 1 wherein the informational
25 data comprises physical information related to physical characteristics of the subscriber.

 10. The device of claim 1 wherein said emergency request controller transmits the informational data stored
30 at said memory element responsive to detection of the

-27-

request to communicate with the emergency dispatch center automatically without additional action by the subscriber.

11. The device of claim 1 wherein said memory
5 element comprises a programmable memory element and wherein the informational data is entered for storage in said programmable memory element by way of the mobile subscriber unit transducer.

10 12. The device of claim 1 wherein said emergency request controller further converts the informational data into a selected format, said selected format identifying the informational data by data type and data amount.

15 13. A method for providing informational data associated with a subscriber of a radio communication system to an emergency dispatch center by way of a mobile subscriber unit, the mobile subscriber unit operable at least to communicate telephonically with the dispatch
20 center responsive to a request entered by way of a mobile unit input element, said method comprising the steps of:

storing the informational data associated with the subscriber in a memory element removably connectable to the mobile subscriber unit;

25 detecting times in which the request to communicate telephonically with the emergency dispatch center is entered by way of the mobile; and

transmitting the informational data stored at the memory element during said step of storing to the
30 emergency dispatch center responsive to detection during said step of detecting of entry of the request to

-28-

communicate telephonically with the emergency dispatch center.

14. The method of claim 13 wherein the informational
5 data stored in the memory element during said step of
storing is stored prior to connecting the memory element
to the mobile subscriber unit.

15 15. The method of claim 13 wherein the informational
data stored in the memory element during said step of
storing is stored subsequent to connecting the memory
element to the mobile subscriber unit.

16 16. The method of claim 13 wherein the mobile
subscriber unit comprises an input keypad and wherein said
step of detecting comprises detecting times in which a
selected sequence of digits is entered by way of the input
keypad.

20 17. The method of claim 13 wherein the mobile
subscriber unit comprises an input keypad having an
actuation key dedicated to requesting emergency assistance
and wherein said step of detecting comprises detecting
times 17 which the actuation key is actuated.

25 18. In a radio telephone having a SIM card
releasably connectable therein, an improvement of a device
for providing informational data associated with a
subscriber of a radio communication system to an emergency
30 dispatch center by way of a mobile subscriber unit
operable at least to communicate telephonically with the

-29-

emergency dispatch center responsive to a request entered by way of the mobile unit input element, said device comprising:

5 selected memory locations of the SIM card for storing therein the informational data associated with the subscriber; and

10 an emergency request controller for detecting times in which the request to communicate telephonically with the emergency dispatch center is entered by way of the mobile subscriber unit, and responsive thereto, for transmitting the informational data stored at said memory element to the emergency dispatch center.

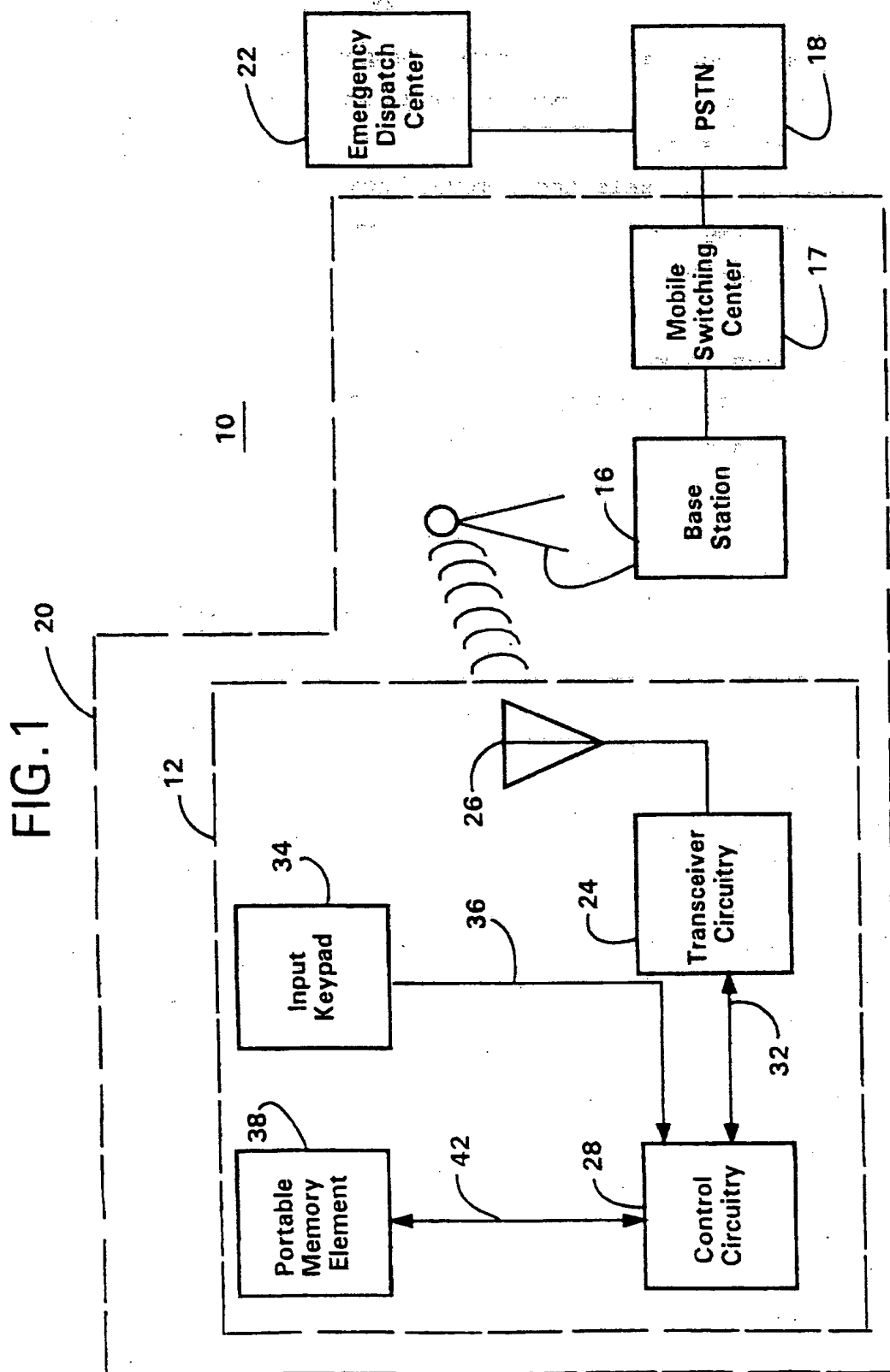
15 19. A SIM card for a radio telephone operable in a wireless communication network, said SIM card comprising:

 an operational data memory location for storing operational data utilized during operation of the radio telephone to access the wireless communication network; and

20 a personal data memory location for storing personal data pertaining to a subscriber of telephonic service in the wireless communication network, the personal data retrievable when a request for emergency assistance is made by way of the radio telephone.

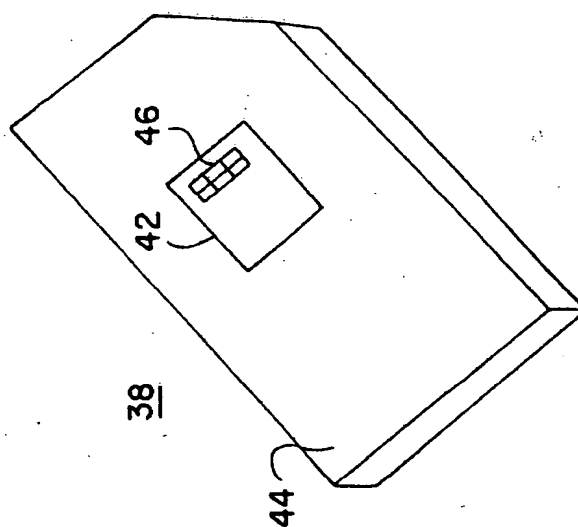
25

1 / 6



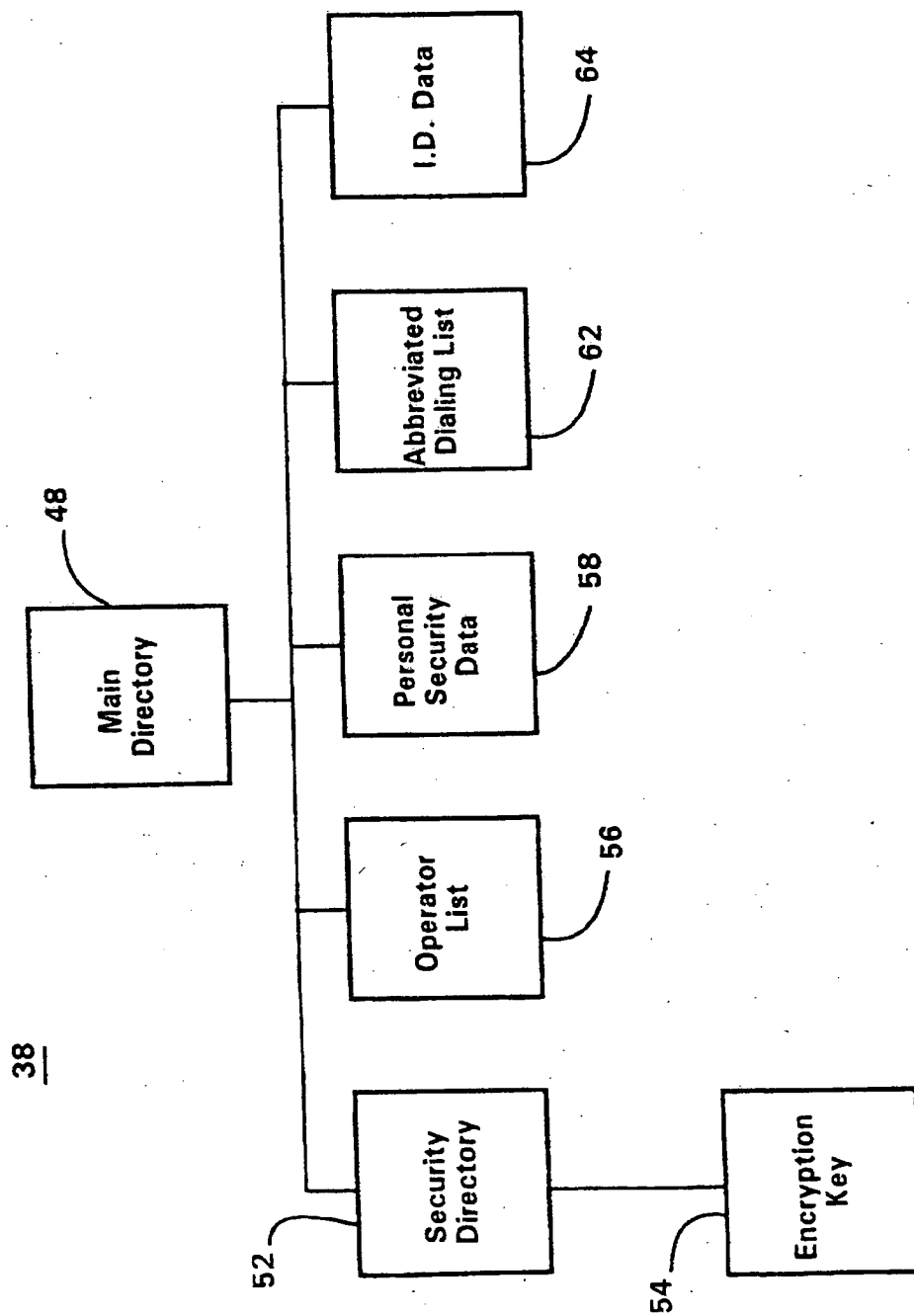
2 / 6

FIG.2



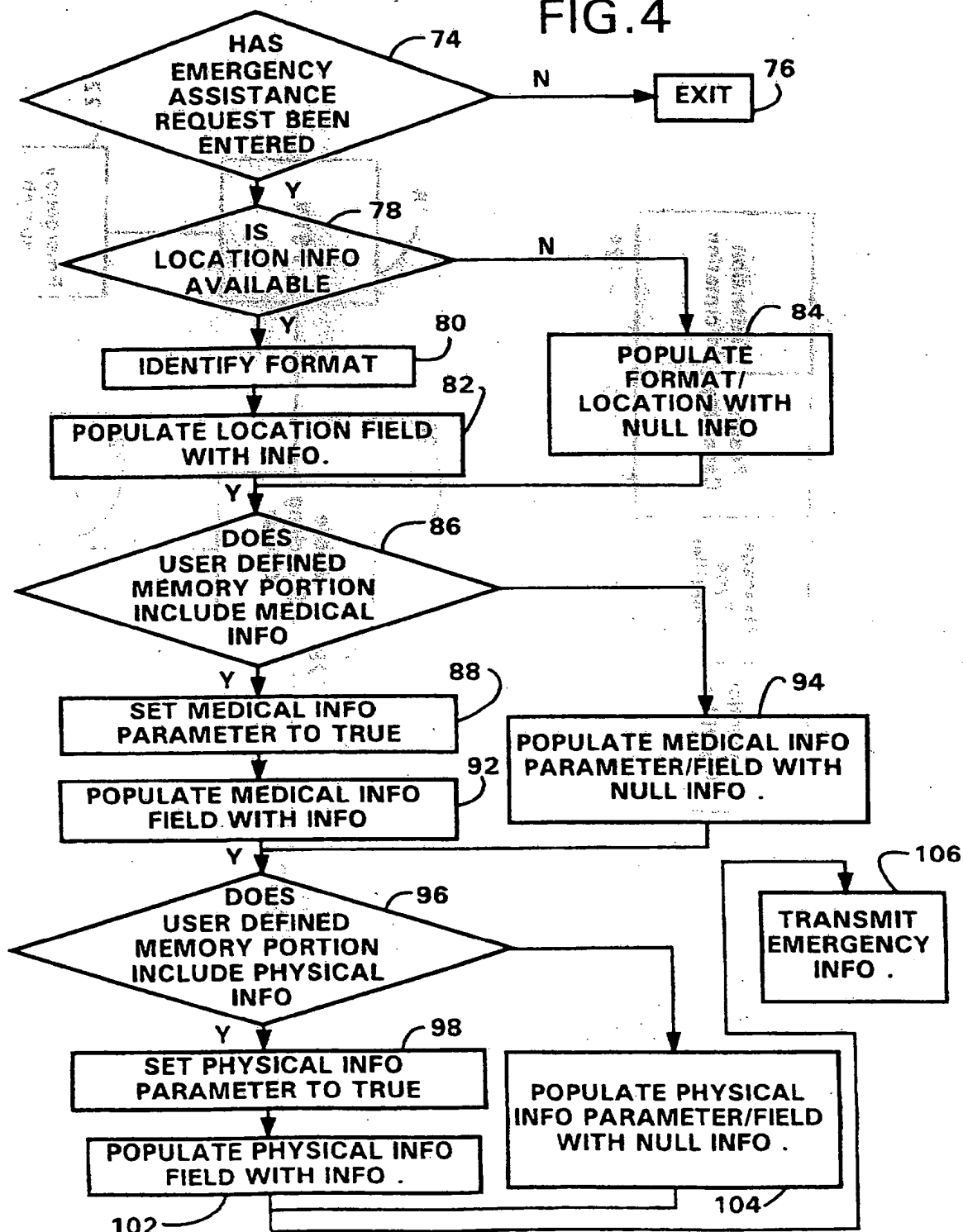
3 / 6

FIG. 3



4 / 6

FIG. 4



112

FIG. 5

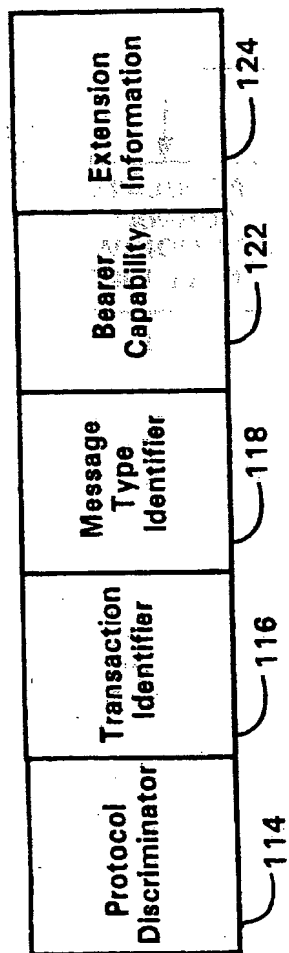
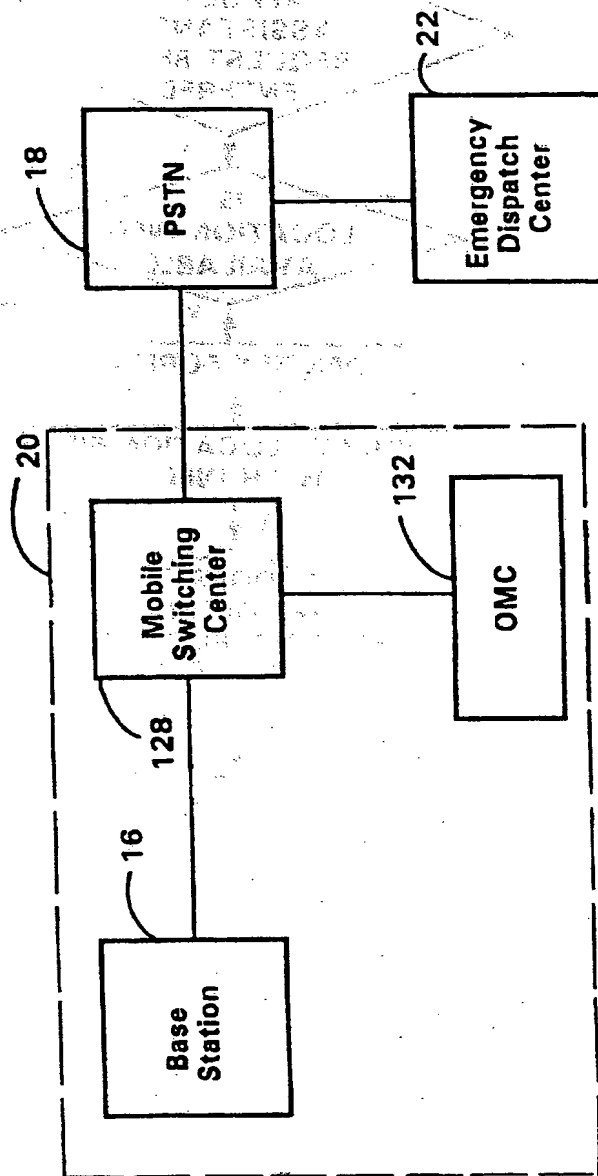
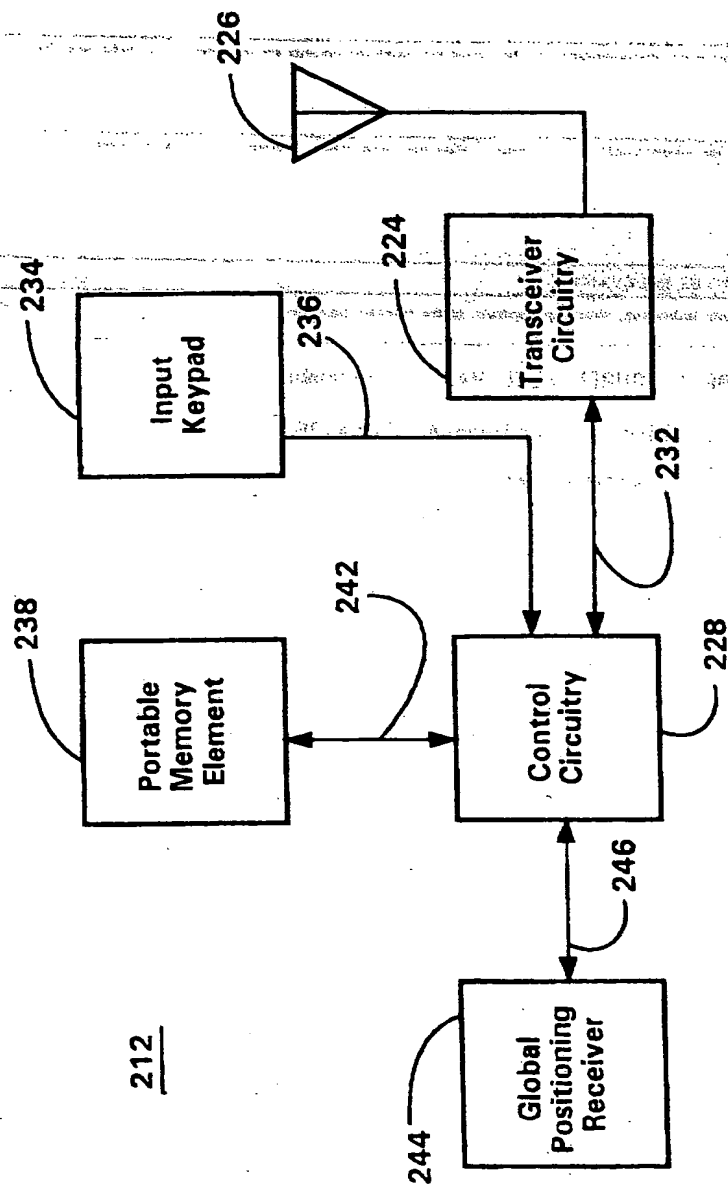


FIG. 6



6 / 6

FIG. 7



INTERNATIONAL SEARCH REPORT

International Application No. **PCT/US 96/20419**

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 H04Q7/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 44 21 508 A (BUREN ELKE VAN) 1 December 1994	1-11, 13-19
A	see column 1, line 1 - column 4, line 30	12
A	EP 0 679 041 A (SIEMENS AG) 25 October 1995	1-19
	see abstract	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- * "A" document defining the general state of the art which is not considered to be of particular relevance
- * "E" earlier document but published on or after the international filing date
- * "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- * "O" document referring to an oral disclosure, use, exhibition or other means
- * "P" document published prior to the international filing date but later than the priority date claimed

* "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

* "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

* "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

* "&" document member of the same patent family

Date of the actual completion of the international search

25 April 1997

Date of mailing of the international search report

29. 05. 97

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer

Andersen, J.G.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 96/20419

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 4421508 A	01-12-94	AU 7067394 A	17-01-95
		WO 9500860 A	05-01-95
		EP 0739491 A	30-10-96

EP 0679041 A	25-10-95	NONE	

Form PCT/ISA/210 (patent family annex) (July 1992)

RECEIVED 10/17/1964

THIS PAGE BLANK (USPTO)

THIS PAGE BLANK (USPTO)